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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/044,864	10/22/2001	Vladimir Zubkov	01-569/LSI1P177	9835	
24319	7590 07/17/20	2			
LSI Logic Corporation			EXAMINER		
1551 McCarthy Blvd.			ERDEM, FAZLI		
M/S: D-106 Patent Department					
Milpitas, CA	95035		ART UNIT	PAPER NUMBER	
			2826		
			DATE MAILED: 07/17/2002	DATE MAILED: 07/17/2002	

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary The MAILING DATE of this communication appears on the cover sheet with the correspondence address Period for Repty		Application No.	Applicant(s)				
Fault Erdem 2826	Office Action Comments	10/044,864					
Period for Repty A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. Bedrations for may be available used the provisions of 3 CFR 1.13(fg). In no event, however, may a reply be timely flied If the period for reply specified above is less than hithy (30) days, a reply with the satisfacty minimum of timp; (30) days wit be considered limely. If he period for reply specified above is less than hithy (30) days, a reply with the satisfacty minimum of timp; (30) days wit be considered limely. If NO period for reply specified above the manifering data of the satisfact acase the application to become ABMADIACED (33) U.S.C. § 133). Parameter of the period for reply specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above the manifering data of the communication. Parameter of the specified above claim (s) the parameter of the specified above the specified above the specified above claim (s) the specified a	Oπice Action Summary	Examiner	Art Unit				
Period for Reply A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. - after 80 x (s) MONTHS from the mailing date of this communication. - if the period crops specified shore is less than thry (d) days, and specify which the databody vinitismum of thirty (30) days will be considered dimary. - if the period crops specified shore is less than thry (d) days, and specified the communication. - if the period crops specified shore is less than thry (d) days, and specified the databody vinitismum of thirty (30) days will be considered dimary. - if the period crops specified shore is less than the received in section of the period of the communication. - if the period crops are the specified shore of the communication of the period of the communication. - Any reply received by the Office the fair the mainteer shore are the mailing date of this communication. - Any reply received by the Office the fair the mainteer of the specified date of the specified on the communication. - Any reply received by the Office than there enclaims are the mainteer place of the communication. - Any reply received by the Office than there enclaims are the mainteer place of the communication. - Any reply received by the Office than there enclaims are the mainteer place of the communication. - Any reply received by the Office than the mainteer and the mainteer place of the communication. - Application is application in for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213. Disposition of Claims - 4) Claim(s) 1-20 isfare pending in the application. - 4a) Of the above claim(s)							
THE MAILING DATE OF THIS COMMUNICATION Extensions or time may be available under the provision of 3 CFR 1 13(6). In no event, however, may a reply be timely filed after 5X (8) MONTHS from the making date of the communication. It Not period for reply is specified above, the maximum statutory period via pays and will source 5X (8) MONTHS from the making date of this communication. Failure to reply in the set or extended period for reply will, by statute, cause the application to become ARANDONED (35 U.S. C.) 13(3). Any reply received by the Office and the horizon broad patient turn application is no condition for allowance are the making date of this communication, even if limitly filed, may reduce any under the making date of this communication. 2a) This action is FINAL. 2b) This action is non-final. 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213. Disposition of Claims 4) Claim(s) 1-20 is/are pending in the application. 4a) Of the above claim(s) is/are allowed. 6) Claim(s) 1-3. 8. 13.14.16-20 is/are rejected. 7) Claim(s) 1-3. 8. 13.14.16-20 is/are rejected. 8) Claim(s) 1-3. 8. 13.14.16-20 is/are objected to. 8) Claim(s) 1-3. 8. 13.14.16-20 is/are rejected. 7) The drawing(s) filed on is/are: a) accepted or b) objected to by the Examiner. Application Papers 9) The specification is objected to by the Examiner. 10) The drawing(s) filed on is/are: a) accepted or b) objected to by the Examiner. 11) The proposed drawing correction filed on is/are: a) approved b) disapproved by the Examiner. 12) The oath or declaration is objected to by the Examiner. 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). 13) All b) Some *0 None of: 1. Certified copies of the priority documents have been received in Application No. 2. Copies of the certified copies of the priority documents have been received in this Nat							
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Art Unit: 2826

DETAILED ACTION

Allowable Subject Matter

1. Claim 4-7, 9-12 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 2. Claims 1-3, 8, 13,14, 16, 17, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao et al. (6,261,963) in view of Welsch et al. (6,226,17).

Regarding Claim 1, Fig. 3 of Zhao et al. shows dielecteric layer 120, copper layer 140 and barrier layer 325A. Zhao et al. disclose this barrier layer to be one of titanium nitride, titanium tungsten, nitrided titanium-tungsten, magnesium, or another suitable barrier material.

Note column 5. Zhao et al. do not show this barrier layer to be an oxide layer doped with one of magnesium, calcium, strontium, beryllium, or barium. However, in the abstract section, Welsch et al. show a directionally grown capacitor anodes where the dielectric layer is doped with oxides of Ca, Mg, Sr, Be and Ba.

Regarding Claims 2, 3, 17, 19 and 20 the abstract section of Welsch et al. show a directionally grown capacitor anodes where the dielectric layer is doped with oxides

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Regarding Claims 8 and 13 Figs. 3-10 show multiple layers of copper interconnect

structure with multiple layers of dielectric and barrier.

Regarding Claims 14, 16 and 18, Columns 8-12 show the method of making a copper

interconnect with multiple layers.

It would have been obvious to one of having ordinary skill in the art at the time the

invention was made to have a barrier dielectric layer of oxide doped with calcium in Zhao et al.

as taught by Welsch et al. because such structure would provide a better protection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Fazli Erdem whose telephone number is (703) 305-3868. The

examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-7722 for regular

communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 308-0956.

FE

July 8, 2002

MATHAN J. FLYNN

SUPERVISORY PATENT EXAMINER

TECHNOLOGY CENTER 2800

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